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Amendments to the Claims

Claim 1 (Original): An antenna comprising:
a reflector having a reflector surface profile for reflecting a signal comprising a plurality of communication bands;
a multi-depth corrugated horn assembly for receiving the signal comprising the plurality of communication bands;
a stepped waveguide coupled to the corrugated horn;
a first polarizer coupled to the stepped waveguide for separating a first communication band from the plurality of communication bands;
a second polarizer coupled to the stepped waveguide for separating a second communication band from the plurality of communication bands; and
a third polarizer coupled to the stepped waveguide for separating a third communication band from the plurality of communication bands.

Claim 2 (Original): The antenna of claim 1 further comprising an input matching section coupled between the multi-depth corrugated horn and the stepped waveguide.

Claim 3 (Original): The antenna of claim 1 wherein the first polarizer comprises:
a plurality of 20 GHz slots coupled to the stepped waveguide;
a first plurality of band reject filters coupled to the plurality of 20 GHz slots;

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a first plurality of magic T networks coupled to the first plurality of band reject filters;

a K-band short slot coupler coupled to the first plurality of magic T networks;

a 20 GHz LHCP port coupled to the K-band short slot coupler; and

a 20 GHz RHCP port coupled to the K-band short slot coupler.

Claim 4 (Original): The antenna of claim 3 wherein the second polarizer comprises:

a plurality of 30 GHz slots coupled to the stepped waveguide;

a second plurality of band reject filters coupled to the plurality of 30 GHz slots;

a second plurality of magic T networks coupled to the second plurality of band reject filters;

a Ka-band short slot coupler coupled to the second plurality of magic T networks;

a 30 GHz LHCP port coupled to the Ka-band short slot coupler; and

a 30 GHz RHCP port coupled to the Ka-band short slot coupler.

Claim 5 (Original): The antenna of claim 4 wherein the third polarizer comprises a septum polarizer having a 45 GHz LHCP port and a 45 GHz RHCP port.

Claim 6 (Original): A method of transmitting data comprising:

reflecting a signal comprising a plurality of communication

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bands into a corrugated horn having dual depth corrugations; and
separating each of the plurality of communication bands with
a multi-band polarizer;

wherein plurality of communication bands comprises a K-band
signal, a Ka-band signal and a EHF-band signal.

Claim 7 (Original): The method of claim 6 further
comprising directing the signal from the corrugated horn into a
waveguide.

Claim 8 (Original): The method of claim 7 further
comprising:

stopping propagation of the K-band signal in the waveguide
with a first step junction; and

stopping propagation of the Ka-band signal in the waveguide
with a second step junction.

Claim 9 (Original): A feed for an antenna system
comprising:

a wideband corrugated horn comprising a plurality of dual
depth corrugations;

a waveguide coupled to the wideband corrugated horn, the
waveguide comprising a first step junction and a second step
junction;

a first polarizer coupled to the waveguide in between the
wideband corrugated horn and the first step junction;

a second polarizer coupled to the waveguide in between the
first step junction and the second step junction; and

a third polarizer coupled to the waveguide after the second
step junction.

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Claim 10 (Original): The feed for an antenna system of claim 9 wherein the first step junction stops the propagation of a K-band signal and wherein the second step junction stops the propagation of a 30 GHz signal Ka-band signal.

Claim 11 (Original): The feed for an antenna system of claim 10 wherein the third polarizer receives an EHF-band signal.

Claim 12 (Original): The feed for an antenna system of claim 9 further comprising an input matching section coupled between the wideband corrugated horn and the waveguide.

Claim 13 (Original): The feed for an antenna system of claim 9 wherein the first polarizer comprises:

- a plurality of 20 GHz slots coupled to the stepped waveguide;

- a first plurality of band reject filters coupled to the plurality of 20 GHz slots;

- a first plurality of magic T networks coupled to the first plurality of band reject filters;

- a K-band short slot coupler coupled to the first plurality of magic T networks;

- a 20 GHz LHCP port coupled to the K-band short slot coupler;
- and

- a 20 GHz RHCP port coupled to the K-band short slot coupler.

Claim 14 (Original): The feed for an antenna system of claim 9 wherein the second polarizer comprises:

- a plurality of 30 GHz slots coupled to the stepped

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waveguide;

a second plurality of band reject filters coupled to the plurality of 30 GHz slots;

a second plurality of magic T networks coupled to the second plurality of band reject filters;

a Ka-band short slot coupler coupled to the second plurality of magic T networks;

a 30 GHz LHCP port coupled to the Ka-band short slot coupler; and

a 30 GHz RHCP port coupled to the Ka-band short slot coupler.

Claim 15 (Original): The feed for an antenna system of claim 9 wherein the third polarizer comprises a septum polarizer having a 45 GHz LHCP port and a 45 GHz RHCP port.

Claim 16 (Original): A apparatus for use in a communication system comprising:

means for reflecting a set of beams from an antenna into an antenna feed, the beam comprising a K-band signal, a Ka-band signal, and an EHF-band signal;

means for separating the K-band signal from the set of beams;

means for separating the Ka-band signal from the set of beams; and

means for separating the EHF-band signal from the set of beams.

Claim 17 (Original): The apparatus of claim 16 further comprising:

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means for separating the K-band signal into a K-band LHCP signal and a K-band RHCP signal;

means for separating the Ka-band signal into a Ka-band LHCP signal and a Ka-band RHCP signal; and

means for separating the EHF-band signal into a EHF-band LHCP signal and a EHF-band RHCP signal.

Claim 18 (Original): The apparatus of claim 17 further comprising:

means for reflecting a X-band signal, wherein the set of beams further comprises the X-band signal; and

means for separating the X-band signal from the set of beams.

Claim 19 (Original): The apparatus of claim 18 further comprising means for forming an X-band single circular beam.

Claim 20 (Original): The apparatus of claim 17 further comprising:

means for reflecting a C-band signal, wherein the set of beams further comprises the C-band signal; and

means for separating the C-band signal from the set of beams.

Claim 21 (Original): The apparatus of claim 20 further comprising means for forming a C-band single circular beam.

Claim 22 (Original): The apparatus of claim 20 further comprising:

means for reflecting a X-band signal, wherein the set of

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beams further comprises the X-band signal; and
means for separating the X-band signal from the set of
beams.

Claim 23 (Original): The apparatus of claim 22 further
comprising means for forming an X-band single circular beam.